CHAPTER 6
Analysis of Alternatives

6.1 Introduction and Approach

6.1.1 Introduction

The *CEQA Guidelines* Section 15126.6 requires that an EIR describe and assess a reasonable range of alternatives to a project that would feasibly meet most of the basic project objectives and avoid or substantially lessen significant project impacts. Thus, the range of alternatives is limited to those that would both avoid or substantially lessen the project impacts and also meet most of the basic project objectives. If an alternative does not reduce or avoid the impacts of the project, then it does not meet the CEQA purpose for the alternatives analysis. If an alternative does not meet most of the project objectives to some degree, then it is not a viable alternative to the project. In addition, an alternative must be feasible – capable of being implemented from a technical, economic, schedule and institutional perspective. CEQA also requires that an EIR evaluate the "No Project" alternative along with its impacts.

The proposed project includes three components to seismically upgrade the dam and its facilities and improve public safety: 1) dam remediation to meet current seismic safety standards, 2) replacement of the outlet tower, and 3) construction of an emergency outlet extension for the emergency outlet facility.

6.1.2 Approach to Alternatives Analysis

In 2005, DWR completed a foundation study of the Perris Dam that indicated the potential for seismically induced slope failure due to liquefaction in the soils beneath the dam, as a result of the characteristic earthquake event (an earthquake with Moment Magnitude of 7.5) on the San Jacinto Fault. The report identified specific actions needed to ensure the continued safe operation of the dam, including the lowered lake elevation. Based on this finding, a Perris Dam Reconnaissance Study was conducted (Washington Group, 2006). The purpose of the Reconnaissance Study was to evaluate alternatives to remediating the foundation of the dam and making the other improvements that would be needed for Perris Dam to safely impound the reservoir at its designed water surface elevation. Alternatives evaluated in the Reconnaissance Study included permanently lowering the lake level, maintaining the existing level, and raising the normal maximum operating level of the reservoir.

As noted above, the proposed project involves three distinct components of dam operation -- the dam itself, the outlet tower, and the proposed emergency outlet extension. Because each project

component provides independent utility and could conceivably be implemented independently of the other two, this chapter considers the project alternative(s) of each component separately. The no-project alternative components are considered together.

6.1.3 Project Objectives

The objectives of the proposed project are to:

- Upgrade SWP infrastructure to meet current seismic standards;
- Maintain SWP delivery commitments;
- Maintain maximum access to beneficial uses at Lake Perris SRA during period of drawdown while ensuring public safety during construction;
- Maintain maximum amount of pre-drawdown riparian habitat at Lake Perris SRA during period of drawdown;
- Minimize risks associated with seismic hazards;
- Provide infrastructure for the implementation of a safe emergency drawdown;
- Enhance and restore public safety;
- Maximize beneficial use of Lake Perris SRA by restoring reservoir to pre-drawdown water levels; and
- Minimize environmental impacts.

6.2 Project Alternatives

6.2.1 Dam Remediation Alternatives

Increased Dam Capacity Alternative

The Reconnaissance Study includes four scenarios for increasing the reservoir operating level above the existing design elevation of 1,588 feet. The Increased Dam Capacity Alternative evaluated here encompasses these four scenarios. Under this alternative, the existing dam would be raised, creating a larger reservoir. Dam remediation would be required, involving the same proposed components as the proposed project, such as deep soil cement mixing, soil re-compaction, and the stability berm. Enlarging the reservoir would inundate existing habitat for Stephens' kangaroo rat, least Bell's vireo, and California coastal gnatcatcher in the northeast end of the reservoir. Therefore, under this alternative a saddle dam would be constructed at the northeast end of the reservoir to protect such habitat. A second saddle dam would also be required at the Bernasconi Pass on the south side of the lake. Additionally, it is assumed that the outlet tower and emergency outlet extension would be constructed at a scale that is appropriate to the dam capacity.

Ability to Meet Project Objectives

The Increased Dam Capacity Alternative would meet each of the project objectives except the objective to maintain the maximum amount of pre-drawdown riparian habitat at Lake Perris SRA. The existing riparian habitat would be inundated. **Table 6-1** summarizes the ability of the Increased Dam Capacity Alternative to meet the project objectives.

Impact Assessment

Aesthetics

Under this alternative two new saddle dams would be constructed in addition to the stability berm. Potential impacts to long-range views from these structures would be substantially greater than the proposed project.

Air Quality

Under this alternative the significant and unavoidable construction emissions identified for the proposed project would increase due to longer duration and the need for more equipment.

Biology

Impacts to biological resources from construction of the proposed project would be increased over a greater distance. Avoidance of sensitive species would be more difficult. The existing riparian habitat supporting least Bells vireo would be inundated. In addition, substantial areas of California coastal gnatcatcher and Stephen's kangaroo rat habitat would be affected.

Cultural Resources

Potential impacts to unknown cultural resources would be increased with the larger construction area.

Geology

Impacts to the unique geologic features within the Bernasconi Hills would be increased due to the higher water levels and the need for saddle dams.

Hazardous Materials

Potential impacts from hazardous materials would be similar to the proposed project.

Hydrology

Increasing the water level elevation could increase groundwater levels downstream which could result in areas of shallow groundwater. This could adversely affect subsurface structures and could result in downstream ponding.

Land Use

Increasing the size of the lake would inundate lands currently used by the State Parks for recreation. However, a larger lake would accommodate a greater number of water-sport visitors.

TABLE 6-1
ABILTY OF PROJECT ALTERNATIVES TO MEET PROJECT OBJECTIVES

Objectives	No Project	Increased Dam Capacity	Reduced Dam Capacity	Recreation Alternative	Decommission Perris Dam	Retrofit Current Outlet Tower
Upgrades SWP infrastructure to meet current seismic standards?	No	Yes	Yes	Yes	Yes	Yes
Maintain SWP delivery commitments?	Yes	Yes	Yes	No	Yes	Yes
Maintain maximum access to beneficial uses at Lake Perris SRA during period of drawdown while ensuring public safety during construction?	No	Yes	No	No	No	Yes
Maintain maximum amount of pre-drawdown riparian habitat at Lake Perris SRA during period of drawdown?	No	No	No	No	No	Yes
Minimize risks associated with seismic hazards?	No	Yes	Yes	Yes	Yes	Yes
Provide infrastructure for the implementation of a safe emergency drawdown?	Yes	Yes	Yes	Yes	Yes	Yes
Enhance and restore public safety?	No	Yes	Yes	Yes	Yes	Yes
Maximize beneficial use of Lake Perris SRA by restoring reservoir to pre-drawdown water levels?	Yes	Yes	No	No	No	Yes
Minimize environmental impacts	Yes	No	No	No	No	Yes

SOURCE: ESA, 2007

Noise

Under this alternative construction noise would be increased due to the wider construction zone and longer construction period due to additional project components.

Public Safety

Construction activities within the park would pose hazards to park visitors for a longer period of time over a wider area.

Public Services and Utilities

Impacts to public services and utilities would be greater than the proposed project since the size of the construction area is wider and the duration of construction longer.

Recreation

Water recreation would be enhanced under this alternative since the surface area of the lake would be increased. Recreational facilities would require modification to accommodate the new shoreline of the larger lake.

Traffic

Impacts to traffic from construction would be greater under this alternative since the construction area is wider and the duration longer.

Summary

The Increased Dam Capacity Alternative would result in increased impacts for many resources since the project would include additional saddle dams requiring more construction over a longer period. This alternative would benefit water-sport activities due to the increased surface area of the lake. **Table 6-2** summarizes the impacts associated with this alternative.

Reduced Dam Capacity Alternative

The Reconnaissance Study includes two scenarios for reducing the reservoir operating level below the existing design elevation of 1,588 feet. The Reduced Dam Capacity Alternative evaluated here permanently reduces the reservoir operating level to Elevation 1,563. Under this alternative, the reservoir would be permanently smaller. This alternative assumes that dam remediation would still be implemented, albeit at a reduced scale compared to the proposed project. This alternative would involve the same dam remediation components as the proposed project, such as deep soil cement mixing and soil re-compaction, albeit at a reduced scale. Additionally, it is assumed the outlet tower and emergency outlet extension alternative would be constructed at a scale that is comparable to the reduced dam capacity assumed for this alternative.

TABLE 6-2
COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT

Potential Impacts	No Project Alternative	Increased Dam Capacity	Reduced Dam Capacity	Recreation Alternative	Dam Decommissioning	Retrofit Current Outlet Tower
Aesthetics	Lesser	Greater	Greater	Lesser	Greater	Lesser
Air Quality	Lesser	Greater	Similar	Lesser	Lesser	Similar
Biology	Lesser	Greater	Greater	Similar	Greater	Similar
Cultural Resources	Lesser	Greater	Similar	Lesser	Lesser	Similar
Geology, Soils, Faulting, and Seismicity	Lesser	Greater	Similar	Similar	Lesser	Similar
Hazardous Materials	Lesser	Similar	Similar	Similar	Lesser	Similar
Hydrology and Water Quality	Greater	Greater	Greater	Greater	Greater	Greater
Land Use	Lesser	Greater	Similar	Similar	Greater	Similar
Noise	Lesser	Greater	Similar	Lesser	Lesser	Lesser
Public Safety	Greater	Greater	Similar	Lesser	Lesser	Similar
Public Services and Utilities	Lesser	Greater	Similar	Greater	Greater	Similar
Recreation	Greater	Lesser	Greater	Greater	Greater	Greater
Traffic and Circulation	Lesser	Greater	Similar	Similar	Lesser	Similar

SOURCE: ESA, 2007

Ability to Meet Project Objectives

The Reduced Dam Capacity Alternative would meet each of the project objectives except the objective to maintain the maximum amount of pre-drawdown riparian habitat at Lake Perris SRA and the objective to restoring the lake to its pre-drawdown condition. Table 6-1 summarizes the ability of the Reduced Dam Capacity Alternative to meet the project objectives.

Impact Assessment

Aesthetics

Under this alternative the potential impacts to long-range views from the stability berm would be similar to the proposed project. This alternative would result in adverse visual impacts due to the exposure of the unvegetated shoreline that previously had been underwater.

Air Quality

Under this alternative the significant and unavoidable construction emissions identified for the proposed project would be similar to the proposed project but would be of shorter duration.

Biology

Impacts to biological resources from construction of the proposed project would be similar to the proposed project. The existing riparian area north of the lake would be eliminated due to the lower lake level. This would adversely affect least Bell's vireo habitat.

Cultural Resources

Potential impacts to unknown cultural resources would be similar to the proposed project.

Geology

Potential impacts to geology would be similar to the proposed project.

Hazardous Materials

Potential impacts from hazardous materials would be similar to the proposed project.

Hydrology

Reducing the water level elevation would decrease groundwater levels downstream, which would result in a reduction of water supplies. This could adversely affect water suppliers in the area.

Land Use

Impacts to land use would be similar to the proposed project.

Noise

Under this alternative construction noise would be similar to the proposed project.

Public Safety

Construction hazards within the park would be similar to the proposed project.

Public Services and Utilities

Impacts to public services and utilities would be similar to the proposed project.

Recreation

Water-sport activities would be constrained under this alternative since the surface area of the lake would be decreased. Recreational facilities would require modifications to accommodate the new shoreline of the smaller lake.

Traffic

Impacts to traffic from construction would be similar to the proposed project.

Summary

The Reduced Dam Capacity Alternative would result in similar impacts for many resources since the project would construct similar facilities. The impacts to air quality would not be avoided. Impacts to biological resources would be greater than the proposed project since the riparian areas would be adversely affected. Table 6-2 summarizes the impacts associated with this alternative.

Recreation Alternative

This alternative permanently reduces the reservoir operating level to Elevation 1,542. Under this alternative, the reservoir would be permanently smaller and used for recreation purposes only, not for water storage. This alternative assumes that dam remediation would not be required. The outlet tower would be reduced in height to accommodate the lowered lake elevation and the emergency outlet extension alternative would be constructed at a scale that is comparable to the reduced dam capacity assumed for this alternative.

Ability to Meet Project Objectives

The Recreation Alternative would meet only four out of eight project objectives. Table 6-1 summarizes the ability of the Recreation Alternative to meet the project objectives.

Impact Assessment

Aesthetics

Under this alternative there would be no potential impacts to long-range views from the stability berm because one would not be constructed. This alternative would result in adverse visual impacts due to the exposure of the unvegetated shoreline that previously had been underwater. The new shoreline would affect the views in the park until new vegetation emerged.

Air Quality

Under this alternative the significant and unavoidable construction emissions identified for the proposed project would be less than that of the proposed project because no dam remediation would be required.

Biology

Impacts to biological resources from construction would be less than under the proposed project. However, the riparian corridor on the original lake shore would be entirely eliminated. A new riparian corridor would emerge at the new lake shore to support sensitive species. The lake would support water fowl and fisheries similar to pre-drawdown conditions, but with the changing water elevation the remaining shallow water habitat would likely diminish. The habitat below the dam would likely remain unaffected.

Cultural Resources

Potential impacts to unknown cultural resources would be lesser than under the proposed project because no haul road over Bernasconi Hills would be required to transport materials since there would be no berm construction.

Geology

Potential impacts to geology would be similar to the proposed project.

Hazardous Materials

Potential impacts from hazardous materials would be lesser than under the proposed project due to the fact that no new berm would be constructed and no asbestos abatement would be required.

Hydrology

Reducing the water level elevation would decrease groundwater levels downstream, which would result in a reduction of water supplies. This could adversely affect water suppliers in the area.

Land Use

Impacts to land use would be similar to the proposed project.

Noise

No dam remediation would be necessary therefore decreasing the amount of construction required and the noise generated.

Public Safety

Construction hazards within the park would be less than the proposed project since no dam construction would occur.

Public Services and Utilities

Impacts to public services and utilities would be greater than to the proposed project. MWD has the ability to use the Perris reservoir for its storage capacity. Although, MWD could operate its system without Lake Perris, the additional emergency storage remains available to them. Reducing this storage would pose a greater impact to water service reliability.

Recreation

Water-sport activities would be constrained under this alternative since the surface area of the lake would be decreased. Recreational facilities would require modifications to accommodate the new shoreline of the smaller lake. Impacts to the hunting and fishing opportunities would be similar to the proposed project.

Traffic

Impacts to traffic from construction would be similar to the proposed project.

Summary

The Recreation Alternative would not require the construction of the new dam and would therefore have different impacts than the proposed project. The impacts to air quality would be decreased due to less construction. Impacts to biological resources would be similar to the proposed project since the riparian areas would be re-emerge following completion of the project. Table 6-2 summarizes the impacts associated with this alternative.

Dam Decommissioning Alternative

The Reconnaissance Study includes one scenario for draining the reservoir and decommissioning the dam. The decommissioning of Perris Dam would require draining the reservoir, removing the outlet tower, and retrofitting the dam to prevent impounding storm water runoff. It is assumed that much of the earthen dam would remain in place. MWD would continue to serve customers via the Santa Ana Pipeline, but would not be able to use the reservoir for emergency storage.

Ability to Meet Project Objectives

The Dam Decommissioning Alternative would only meet the project objectives that pertain to minimizing seismic hazards, restoring public safety, meeting seismic standards, and maintaining SWP delivery commitments. The removal of impounded water would eliminate the potential dam failure hazard. Table 6-1 summarizes the ability of the Dam Commissioning Alternative to meet the project objectives.

Impact Assessment

Aesthetics

Under this alternative, potential impacts to long-range views from the stability berm would be eliminated. However, draining the lake would significantly change the character of the area.

Air Quality

Under this alternative the significant and unavoidable construction emissions identified for the proposed project would be largely avoided. However, the dry lake bed could generate fugitive dust emissions until vegetation is reestablished, which could take several years in the arid region.

Biology

Impacts to biological resources from construction of the proposed project would be avoided, including the removal of riparian habitat at the toe of the dam. However, draining the lake would remove the water source for the entire riparian habitat in the area, which would result in the elimination of the surrounding riparian habitat. This could significantly affect the federally listed least Bell's vireo. The desert habitat would eventually re-vegetate the lake bed, but the riparian habitat would be eliminated permanently, resulting in significant impacts to biological resources. The value of the lake to fisheries and water fowl would be entirely eliminated, resulting in a significant impact of the project.

Cultural Resources

Potential impacts to unknown cultural resources would be avoided with the elimination of earth moving activities.

Geology

Decommissioning the dam and draining the lake would eliminate the potential hazard of dam failure from seismic events. Impacts to the unique geologic features within the Bernasconi Hills would be avoided.

Hazardous Materials

Potential impacts from hazardous materials would be less than the proposed project since excavation would be substantially avoided.

Hydrology

Draining the lake would substantially reduce groundwater recharge and would lower the water table downstream. This would significantly affect water supply in the communities downstream from the dam. Storm water draining into the former lakebed would need to be channeled downstream of the dam. This would require constructing storm drain facilities to connect with the Perris Valley Storm Drain.

Land Use

Decommissioning the dam would remove recreational uses at Lake Perris SRA. This would significantly affect the State Parks facility. Impacts to the Fairgrounds would be avoided.

Noise

Under this alternative construction noise would be avoided.

Public Safety

This alternative would eliminate hazards of potential dam failure.

Public Services and Utilities

Decommissioning the Perris Dam would remove the reservoir's water supply functions, which include providing emergency standby storage and domestic drinking water supply. MWD has the ability to use the Perris reservoir for its storage capacity. Although, MWD could operate its system without Lake Perris, the additional emergency storage remains available to them. Reducing this storage would pose a greater impact to water service reliability.

Recreation

Under this alternative, water-based recreation would no longer be available. Land-based recreation opportunities would remain following restoration of the area. This would be a significant impact to recreational opportunities in the region.

Traffic

Construction traffic would be eliminated under this alternative.

Summary

The decommissioning of Perris Dam would avoid significant impacts to air quality resulting from the proposed project, but it would result in additional significant impacts to aesthetics, biological resources, land use, drainage, public utilities, and recreation. As a result, this alternative was not considered further. Table 6-2 summarizes the impacts associated with this alternative.

6.2.2 Outlet Tower Alternative

Tower Retrofit

This alternative would include the seismic retrofit of the existing outlet tower. The retrofit would include updating the tower structure to meet current seismic criteria.

Ability to Meet Project Objectives

The Tower Retrofit Alternative would meet the project objectives associated with tower improvements, including upgrading the tower to meet current seismic standards; minimizing the risks associated with seismic hazards affecting the tower; and thereby generally improving public safety. **Table 6-1** summarizes the ability of the Outlet Tower Alternative to meet the project objectives.

Impact Assessment

Aesthetics

Retrofitting the tower would involve underwater and underground construction activities. Therefore, this alternative would not have any aesthetic impacts because the construction would not obstruct views of the area.

Air Quality

This alternative would result in similar air emissions from construction equipment and delivery trucks.

Biology

The underwater construction necessary for this alternative could temporarily affect aquatic resources at the base of the tower. However, these effects would not be considered significant.

Cultural Resources

Retrofitting the tower would not affect cultural resources.

Geology

Retrofitting the tower would not affect geology.

Hazardous Materials

Potential impacts from hazardous materials would be similar to the proposed project.

Hydrology

Under water construction could affect water quality due to increased turbidity. This effect would be temporary.

Land Use

Retrofitting the tower would not have an impact on land use.

Noise

This alternative would avoid the need for blasting which would reduce noise impacts of the proposed project.

Public Safety

This alternative would meet the objective of eliminating potential seismic hazards.

Public Services and Utilities

The alternative would not affect public services or utilities.

Recreation

During construction activities for this alternative, water-based recreational activities would not be allowed near the tower. This would be a temporary impact.

Traffic

Retrofitting the tower would have similar traffic impacts as the proposed project.

Summary

Retrofitting the outlet tower would reduce temporary construction impacts associated with the proposed project including noise. However, the contribution to potentially significant construction air emissions would be similar to the proposed project.

6.2.3 Emergency Outlet Extension Alternatives

Fully Covered Outlet Extension Alternative

Under this alternative, the proposed emergency outlet extension would be constructed similar to the proposed project's underground emergency outlet extension alternative, except that the extension would be fully covered its entire length.

Ability to Meet Project Objectives

This alternative would meet project objectives associated with the proposed emergency outlet extension including reducing risks associated with seismic hazards and improving public safety, by channeling emergency releases from the dam away from development below the dam site. Table 6-1 summarizes the ability of the Fully Covered Outlet Extension Alternative to meet the project objectives.

Impact Assessment

Aesthetics

This alternative would reduce aesthetic impacts of the proposed project by placing the emergency outlet tower underground and out of site of local views for its entire length.

Air Quality

This alternative would result in similar air quality impacts.

Biology

Impacts to biological resources would be similar to the proposed project.

Cultural Resources

This alternative would have similar impacts to cultural resources as the proposed project.

Geology

This alternative would have similar impacts to geology as the proposed project.

Hazardous Materials

Potential impacts from hazardous materials would be similar to the proposed project.

Hydrology

This alternative would have similar impacts to hydrology as the proposed project.

Land Use

Under this alternative, land use impacts along Ramona Expressway would be reduced.

Noise

The alternative would have similar impacts to noise as the proposed project.

Public Safety

After the construction of the project, the increased durability of the outlet extension would meet the project objectives for increased public safety.

Public Services and Utilities

Under this alternative impacts to public services and utilities would be the same as the proposed project.

Recreation

Under this alternative, impacts to recreation would be similar to the proposed project.

Traffic

Under this alternative impacts to traffic would be the same as the proposed project.

Summary

Under the Fully Covered Outlet Extension Alternative impacts would be similar to the proposed project except that the final segment of the extension would also be underground, reducing impacts to aesthetics and land use.

6.3 No Project Alternative

The No Project Alternative assumes the proposed Perris Dam Remediation Program would not occur. This alternative would assume that the existing lowered level of Lake Perris would remain at an elevation of 1,563 feet. No additional project elements, such as the emergency outlet extension and outlet tower would be constructed.

Ability to Meet Project Objectives

The No Project Alternative would not meet any of the project objectives. The seismic upgrade to meet current standards would not occur; a reduced safety risk associated with seismic hazards would not be achieved; enhanced and restored public safety would not be achieved, and recreational uses at Lake Perris SRA would not be maximized. Table 6-1 summarizes the ability of the No Project Alternative to meet the project objectives.

Impact Assessment

This Alternative would result in the permanent lowering of the water surface elevation to the existing condition of 1563 feet, which would reduce the potential dam inundation area in the

event of a maximum probable earthquake. No short term construction related impacts would result under this alternative because no construction activities would occur. Permanently maintaining the water surface elevation at 1563 feet would result in long-term and potentially significant impacts to biological and recreational resources. Furthermore, a release of emergency overflow water would not be contained in a channel as compared to the proposed project. Thus, this alternative could result in flood hazards.

6.4 Alternative Borrow Area Location

DWR has proposed the use of the lake bed for the source of material for the stability berm since the area is readily accessible, the site is owned by DWR, the material is suitable, and its use would minimize impacts of hauling the material from an off-site location. The original dam was constructed from a borrow area in the lake bed that is currently below the water level.

The preferred borrow site for the material needed for the stability berm (the site currently proposed) is located on the northeast end of the lake. The borrow material would be excavated from the lake bed that was exposed as a result of the 25-foot drawdown imposed as an interim safety measure at the end of 2005. The material would be transported to the construction site via a haul road constructed mostly on the lake bed and around the south side of the lake, near the left abutment. Approximately two miles of temporary haul road would be constructed on the exposed lake bed, and less than a mile of haul road would be constructed outside the rim of the lake to traverse up and over the rock slope near the left abutment. The equipment used for the excavation and transport would likely include excavators at the borrow site and off-highway trucks for the transportation of the material to the construction site. DWR staff provided a rough estimate of $6/cy for excavating and transporting material to the berm site, producing a total material cost of $10.5 million for the preferred borrow site (DWR, 2009).

The Alternative Borrow Area Location would be located within a 20-mile radius of Lake Perris, at an aggregate mine capable of producing the required volume of fill materials. Although several quarries exist within a 20-mile radius of Lake Perris, transporting the estimated two million cubic yards of material over local roadways would result in significant damage to the roads. The Alternative Borrow Area Location would require the use of state highways to transport the material to the site, and would therefore significantly impact local traffic (i.e., level of service and safety on roadways) and air quality, but would not impact local habitat as the preferred borrow site would. An estimate of the cost of the Alternative Borrow Area Location assumed a 20 mile haul distance, 12 cy capacity truck, $100/hr trucking rate, and $4/cy material cost. Utilizing these parameters, DWR estimated the cost of material acquisition and transport to be approximately $16.50/cy, for a total cost of approximately $29 million for the Alternative Borrow Area Location (DWR, 2009).

The preferred borrow site would impact shallow water habitat requiring mitigation measures for any permanently lost habitat. The final amount of restoration habitat would be determined after construction. DWR has proposed mitigation to assist in restoring the fishery, including restoration of disturbed areas and the purchase of off-site habitat at a 1:1 ratio, but the success of the restoration is speculative, and may not be effective. Therefore, the EIR acknowledges that loss of

the shallow water habitat is a potentially significant and unavoidable impact to recreational opportunities at the SRA including duck hunting and fishing (Impact 3.12-3).

Utilization of the Alternative Borrow Area Location would eliminate the significant and unavoidable impact related to recreational resources caused by the loss of shallow water habitat, as the Alternative Borrow Area Location would be an existing aggregate mine and thus would not impact any habitat. However, due to the Alternative Borrow Area Location's longer haul distance, more air pollution and increased traffic on local roads would result.

URBEMIS2007 software was used to estimate project related construction emissions for each borrow site alternative (i.e., the preferred borrow site and the Alternative Borrow Area Location). The results of the modeling were compared to the applicable SCAQMD thresholds (Refer to **Table 6-3** and **Table 6-4**). As shown, the Alternative Borrow Area Location would result in greater quantities of all analyzed pollutants. Particularly, the Alternative Borrow Area Location would result in significant increases in ROG such that the selection of the Alternative Borrow Area Location, as opposed to the preferred borrow site, would result in a significant impact in ROG emissions. In addition, while emissions of NOx would be significant in either borrow site, NOx emissions resulting from the Alternative Borrow Area Location would be considerably increased. Furthermore, it is important to note the differences in CO_2 emissions. The Alternative Borrow Area Location would generate 115,201 lbs/day more CO_2 than the proposed borrow site, which equates to seven times more CO_2 than the proposed borrow site. Thus, with respect to air quality, the Alternative Borrow Area Location would result in significant increases in air quality impacts, as compared to the proposed borrow site.

TABLE 6-3
PROPOSED BORROW SITE CONSTRUCTION EMISSION ESTIMATES (LBS/DAY)

	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
2009 TOTALS (lbs/day unmitigated)	13.96	169.50	68.97	0.17	1,120.63	239.31	20,095.05
2010 TOTALS (lbs/day unmitigated)	13.03	155.29	63.51	0.17	1,119.90	238.63	20,095.01
SCAQMD Regional Significance Threshold	75	100	550	--	150	75	--
Potential Impact	No	Yes	No	NA	Yes	Yes	NA

TABLE 6-4
ALTERNATIVE BORROW AREA LOCATION CONSTRUCTION EMISSION ESTIMATES (LBS/DAY)

	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
2009 TOTALS (lbs/day unmitigated)	83.76	1,098.84	425.61	1.24	1,163.31	276.31	135,296.51
2010 TOTALS (lbs/day unmitigated)	77.99	1,001.83	388.54	1.24	1,158.39	271.78	135,296.47
SCAQMD Regional Significance Threshold	75	100	550	--	150	75	--
Potential Impact	Yes	Yes	No	NA	Yes	Yes	NA

The environmental impacts associated with on and off-site borrow sources include lost habitat, increased traffic, and increased air pollution. The net cost of environmental mitigation for each alternative have not been estimated however, based on cost estimates provided by DWR, the material and labor cost alone for the currently proposed borrow site is $18.5 million less than the Alternative Borrow Area Location. If the net costs of environmental impacts were included, the currently proposed borrow site may be even more economically attractive.

6.5 Environmentally Superior Alternative

CEQA requires that an EIR identify an environmentally preferred alternative (*CEQA Guidelines* Section 15126.6[e][2]). The Increased Dam Capacity Alternative would provide the potential for greater water storage in the region. However, raising the dam and constructing new saddle dams would significantly increase the construction impacts associated with the proposed project. Impacts to air quality, noise, traffic, and biological resources would each increase significantly. Land uses would be altered due to the larger lake that would accommodate increased water-related recreation activities. The No Project Alternative, the Dam Decommissioning Alternative, and the Recreation Alternative would eliminate the significant impact to air quality resulting from the proposed project. However, the Recreation Alternative and the Dam Decommissioning Alternative, along with the Reduced Dam Capacity Alternative would each result in significant impacts to biological resources since the riparian areas would be eliminated or significantly reduced in size. These three alternatives also would significantly impact recreational uses of the lake due to reductions in lake surface area. For these reasons, the proposed project is the environmentally superior dam remediation alternative.

The Outlet Tower Retrofit Alternative would avoid impacts associated with blasting. Otherwise, it could increase water quality impacts during construction. Other construction impacts would be similar. Due to potential water quality impacts during construction for the retrofit alternative, the proposed project is considered the environmentally superior outlet tower alternative.

The Open Channel Outlet Extension Alternative would not avoid any of the significant impacts of the proposed project and would increase impacts to aesthetics, biology, land use, and recreation. The Fully Covered Outlet Extension would lessen impacts to aesthetics, land use, and recreation relative to the proposed project, and would therefore be considered the environmentally superior outlet extension alternative.